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ORIGINAL RESEARCH

THE ROLE OF EQUIPMENT, THE PHYSICAL ENVIRONMENT AND TRAINING PRACTICES IN CUSTOMER SAFETY WITHIN FITNESS FACILITIES: THE PERSPECTIVES OF FITNESS INDUSTRY EMPLOYEES

Shannon E Gray¹, Patrick Keyzer², Kevin Norton³, Joachim Dietrich⁴, Betul Sekendiz⁵, Ian Coyle², Caroline F Finch⁶

¹ Monash University Research Institute, Monash University, Clayton, Australia

² School of Law, LaTrobe University, Bundoora, Australia

³ School of Health Science, University of South Australia, Adelaide, Australia

⁴ Centre for Law, Governance and Public Policy, Bond University, Gold Coast, Australia

⁵ School of Medical and Applied Sciences, Central Queensland University, Rockhampton, Australia

⁶ Australian Centre for Research into Injury in Sport and its Prevention, Federation University, Ballarat, Australia

Corresponding author: Shannon E Gray

Monash Injury Research Institute, Tel: +61 3 9905 1255, Email: shannon.gray@monash.edu, 21 Alliance Lane, Clayton, Victoria 3800, Australia

ABSTRACT

Introduction: Fitness facilities provide an avenue for people to engage in physical activity; however, it is important that these facilities have effective strategies to reduce the risk of injuries to their customers. The attitudes of fitness industry employees with respect to safety can influence the implementation of risk management practices that can then impact on the success of such strategies. The aim of this study was to identify views of nationwide fitness industry employees about safety hazards associated with equipment, training practices and the physical environments within fitness facilities.

Methods: A 6-week nationwide online cross-sectional self-report survey consisting of 13 basic demographic questions and 10 questions relating to equipment, training practices and physical environment of fitness facilities, extracted from a 45 item questionnaire, answered on a 6-point Likert scale.

Results: The majority of the 1178 respondents believed their premises were safe (94.9%). Major factors compromising safety identified by respondents were lack of ventilation (68.9%) and customers frequently observed to leave equipment lying around (43.8%). Over 90% of respondents believed that both the layout of the equipment in their facility and its design was good. There was frequent observation of equipment misuse and customers using weights that were too heavy for them (41.9% and 47.8% respectively).

Conclusions: Fitness facilities should implement preventative maintenance of their physical environment and equipment as standard practice. Only qualified fitness professionals should be hired and provided with extensive risk management training to support their role of overseeing customer safety and improving customer training practices.

Keywords: fitness centre; exercise; safety; injury; risk management

INTRODUCTION

The importance of regular physical activity as a preventative measure in reducing preventable mortality and morbidity is recognised both in Australia and globally.^{1,2} According to the Australian Bureau of Statistics, “fitness/gym” activities are the second most popular physical activity behind “walking for exercise”, particularly among people aged 15 to 34 years.³ Fitness facilities are a popular venue for physical activity with their readily available facilities and equipment³. The Australian fitness industry has grown considerably in recent years with the number of fitness centres Australia-wide increasing from 667 in June 2001 to 974 in June 2005 to 1572 in June 2008.⁴

Injuries and/or adverse health outcomes can occur during any activity typically performed at a fitness facility.⁵⁻⁷ Considering the popularity of fitness facilities as venues for physical activity, it is important that they provide a safe and healthy environment for their customers, to minimise the likelihood of injury and adverse health outcomes from occurring. All other things being constant, it is an inescapable mathematical fact that the growth of the industry and the consequent increased number of participants must increase the number of people at risk of injury.

Risk management policies and practices are necessary for fitness facilities to satisfy their duty of care towards the health and safety of their employees and clients alike by minimising the possibility of injuries and adverse health outcomes occurring in the first place.⁸⁻¹⁰ Lack of, or poor, risk management at a fitness facility can also lead to increased exposure to potential liability and financial loss, should an adverse event occur.^{8,11}

Currently there are no specific Australia-wide standards or guidelines that fitness facilities can employ to improve their health and safety conditions.¹¹ Aside from the Northern Territory which has none, all states and territories have voluntary (New South Wales (NSW), Victoria, Tasmania) or mandatory (Australian Capital Territory (ACT), Queensland, Western Australia (WA), South Australia) Fitness Industry Codes. However, these differ in their degree of detail for

managing risk.¹¹

Some of the key health and safety issues in the fitness industry are related to the use of exercise equipment, the physical environment in which it is used and the training practices of customers.¹² Injuries that are associated with the physical environment and equipment are likely to be acute and traumatic in nature, but also preventable through adequate attention to the factors that cause them.^{7,13,14} It is in the interests of fitness facility managers to perform regular risk assessments that include risk identification, analysis and evaluation procedures to identify and evaluate existing risk controls. Fitness industry professionals should be encouraged to be vigilant with respect to safety, as it has been strongly argued that problems with safety have stemmed from poor attitudes of management towards health and safety.¹⁵

Given the particular importance of how attitudes can affect implementation of safety practices, the aim of this study was to probe the opinions of fitness industry professionals with respect to the safety hazards associated with the equipment used in and the physical environment of their fitness facility, and customer training practices. This is a necessary preliminary step toward the development of better risk management policies, protocols and practices.

METHODS

The Australian Fitness Industry Risk Management (AFIRM) project was designed to determine how Australian regulation currently controls risk management in the fitness industry and thereby minimises adverse health outcomes and injury. As part of the AFIRM project, a nationwide, online survey of fitness professionals was undertaken from 5 May to 21 June 2013, inclusive.¹²

The survey was distributed via social media and administered online via Survey Monkey. This involved respondents completing a self-report survey that was designed following extensive industry consultation and input from the research team. The methods underpinning the development and conduct of the survey has been described in

full elsewhere.¹² Information about the availability of the survey was distributed through research team networks and the nationwide professional body networks of Fitness Australia and Sports Medicine Australia. Participation in the survey was voluntary and completion of the survey was taken to indicate consent. The survey was approved by the Bond University and University of Ballarat Human Research Ethics Committees in accordance with recognised national human research ethics protocols.

The full survey contained 13 basic demographic questions (e.g. age, gender, education level), and 45 randomly ordered questions related to operating

procedures and conditions of fitness facilities. It also provided an opportunity for respondents to add further comments on what they might now do differently, having completed the survey. For the purposes of this paper, all questions relating to equipment use and training practices of customers and the layout and condition of the facilities where they worked were extracted (10 questions), along with the respondents' basic demographics and relevant answers to the open-ended question.

The 10 extracted questions (which appear in Table 1 as they were in the survey) asked respondents to rate their opinion on a 6-point Likert scale. The options available to respondents in

Table 1: Respondent ratings of various aspects of responses for each equipment or physical environment questions within their facilities

	Number of respondents (n=)	Preferable answer (%)	Non-preferable answer (%)
General safety			
Overall, how safe are the premises (including access, lighting, toilets, locker rooms, floor surfaces etc.) where your facility is located?	922	Safe 94.9	Unsafe 5.1
Physical Environment			
How important is lack of ventilation/heat in your facility?	992	Important 68.9	Unimportant 31.1
How frequently do you observe overcrowding in your facility?	980	Infrequently 71.1	Frequently 28.9
How well designed/ergonomic is the layout of equipment in your facility?	911	Good 90.8	Poor 9.2
Training Practices			
How frequently do you observe customers leaving gym equipment and personal items lying around in your facility?	999	Infrequently 56.2	Frequently 43.8
How frequently do you observe customers using weights that are too heavy?	964	Infrequently 52.2	Frequently 47.8
How frequently do you observe equipment misuse in your facility?	978	Infrequently 58.1	Frequently 41.9
Equipment			
How frequently is out of date/poorly-designed equipment replaced in your facility?	942	Frequently 65.2	Infrequently 34.8
How frequently do you observe faulty equipment in your facility?	947	Infrequently 72.0	Frequently 28.0
Generally, how would you rate the design of the equipment used in your facility?	979	Good 93.3	Poor 6.7

Note: wording of each question is how it appeared in the survey

the Likert scale were either somewhat, very or extremely positive or negative (e.g. could be related to frequency, quality or competency). Preferable answers were those that suggested the equipment and environment were more appropriately managed for risk than non-preferable answers (for example, a respondent somewhat/very/extremely frequently observing equipment misuse in their facility was a non-preferable answer).

Data were analysed using descriptive frequencies in SPSS Version 21. The proportions of respondents giving each of the possible responses were calculated for each question and these proportions were collapsed into categories representing preferable and non-preferable answers, based on the content of the question. Relevant responses to the open question were extracted and summarised.

RESULTS

There were 1178 survey respondents, however not all answered every question. Approximately half of all respondents were aged less than 40 years (48.7%). The majority were registered with Fitness Australia (n=1092, 95.2%). Almost one third of respondents held a Certificate I-IV in fitness (n=374, 31.7%), and 37.4% had completed either a Bachelor's (n=294) or a Postgraduate degree (n=146). Almost half were either self-employed or a sole trader (n=540, 47.0%) within the fitness industry, and a quarter of respondents had worked in the fitness industry for 5-10 years (n=267). Around a third worked fewer than 11 hours per week (n=401, 34.0%) and only 19.4% worked full-time or greater than 35 hours per week (n=229). The largest number of respondents were from New South Wales (n=292, 32.5%) and most respondents worked at small facilities (<500m²) (n=448, 41.8%).

The majority of respondents (80.2%) rated their premises as either very or extremely safe. Despite this, almost a quarter of respondents very/extremely frequently witnessed customers leaving gym equipment and personal items lying around (23.4%). Ventilation was viewed as a very/extremely

important issue by approximately half of respondents (51.2%). Respondents very/extremely frequently witnessed customers using weights too heavy for them 21.1% of the time.

The proportion of respondents who rated various aspects of the equipment and physical environment within their facilities for each of the 10 questions is summarised in Table 1.

Of the 1178 respondents, 684 provided a response to the open question asking what might be done differently upon completion of the survey (58.1%). The main change that would be implemented by the respondents was to place higher importance on the safety of customers. Respondents suggested the following methods by which they could achieve this:

- being more attentive to the gym environment (for example, encouraging users to replace equipment or ensure surfaces are dry and clean)
- informing users about correct technique (even if users are not the respondents' clients)
- ensuring equipment maintenance is up to date
- discussing safety issues with co-workers to improve the safety culture of the facility
- actively seeking new health and safety information
- increasing supervision of the gym floor.

DISCUSSION

This nationwide survey of 1178 fitness professionals across Australia provides new insights into respondents' opinions of the health and safety of their facilities and the extent to which they believed customers encountered risks associated with the equipment, the physical environment, and their training practices within these facilities.

A previous Victorian study of multi-purpose recreation facility users found that the majority of respondents (72%) deemed safety an important issue.¹⁰ The safety of the AFIRM survey respondents' premises was viewed as exceedingly safe. It is in the best interests of fitness facilities to appear safe to potential new members (e.g. being well lit inside and out), which could explain why this was so positively skewed. It is most important

however, that a fitness facility does not just appear safe but that it actually implements safe practices. On the other hand, it may be that the conclusion of a significant majority of respondents that facilities are very safe or extremely safe was a response to a general question, to which there are exceptions.

Perhaps this is how the findings at issue herein should be interpreted. On this basis, it is worrying that 43.8% of respondents reported that they frequently observed customers leaving gym equipment and personal effects lying around the facility. Weights and other movable gym equipment left lying around can present a tripping hazard. Personal effects, which could include clothing, drink bottles and towels, can also still be a trip hazard. Trips, slips and falls are a major source of hospital admissions in the home, work and leisure environment generally. An epidemiological study into hospital-treated injuries sustained at Victorian fitness facilities found that falls were a leading cause of injuries, and if equipment and other objects are left lying around fitness facilities fall probability increases through tripping over objects.⁷

As noted previously, 68.9% of respondents deemed lack of ventilation or heat in a facility important. Poor ventilation is a hazard that can result in adverse physical health effects,¹⁶ as it allows for the accumulation and mixture of hazardous contaminants. For those working out in fitness facilities, elevated carbon dioxide and reduced oxygen levels¹⁶ can lead to additional physiological stresses such as increased heart and breathing rates, reduced attention span and concentration, and compromised sensory and motor skills.¹⁷ During fitness activities involving lifting heavy weights or using motorised equipment, the likelihood of incidents and injuries occurring could be increased with poor ventilation, as has been shown for those operating heavy machinery in poorly ventilated environments.¹⁸

Facility layouts were deemed to be good by a significant majority of survey respondents (90.8%). Whilst most respondents infrequently observed overcrowding in their facility, more than one in four reported seeing it frequently. Overcrowding during group exercise classes can be hazardous as it

increases the risk of body contact with other facility users or with equipment.

Almost half of the respondents frequently observed customers using weights that were too heavy for them to use. Approximately one in every five respondents very/extremely frequently saw customers lifting weights beyond their abilities. Given that survey respondents cannot be expected to have full knowledge of the training routines and relative strengths of all customers, responses to this question were assumed to be based on the customers' observed rated perceived exertion. This method of observation allows insight into the level of intensity of training of the customer. Lifting weights that are too heavy for the individual can be particularly damaging to both the individual (overexertion or overuse injuries as well as crush injuries if they were to drop them) and those exercising nearby if hit by a falling or out-of-control weight.¹⁹ This highlights the need for proper induction for new customers and ongoing vigilant supervision of their activities by staff. The American College of Sports Medicine's guidelines for fitness facilities (which do not set a standard of care for fitness facilities) recommend that qualified personnel should offer orientation services to new members so they may properly undertake their exercise program, as well as provide instructions on the use of the facility's equipment.⁸

Injuries can occur when fitness participants are keen to try a new exercise using a piece of equipment they are not familiar with. Customers were frequently observed to misuse equipment by 41.9% of respondents. Across all fitness activities, equipment misuse can occur and the type of injuries sustained varies across these (depending on equipment used).²⁰ Without adequate knowledge of biomechanics or physical exercise, and the correct method of equipment use to get the most benefit from it, injuries are much more likely to occur. Misusing fitness equipment can damage the equipment and compromise the safety of the user due to poor technique and contact injuries. And, to reiterate, equipment misuse can also compromise the safety of other facility users. In an American study of weight training injuries approximately one

quarter of all injuries were due to improper use of equipment.²¹ Risk management strategies to minimise the hazards associated with equipment misuse, such as the adoption and implementation of appropriate induction programs, supervision and instructional signs on equipment, would be appropriate.

Manufacturers of fitness equipment set standards for equipment use. The ACT's mandatory Code of Practice states that all fitness equipment must comply with Australian standards.²² Whilst voluntary, the NSW and Victorian Codes of Practice also state that fitness facilities must install equipment that complies with manufacturers' standards.^{23, 24}

Faulty equipment was not often observed, and the majority of respondents believed that out-of-date or poorly designed equipment was replaced frequently. If faulty or out-of-date equipment is replaced frequently or signposted (so that fitness users are aware not to use it), it is likely that injury risks will be reduced. Facilities should require users to report faults with equipment, whether by signs (instructing them to) or as part of induction procedures.

There are a number of possible limitations to the survey. First, the sample was not a random sample of fitness professionals. It was, in effect, a large convenience sample. However, the sample size is large and widely distributed across the continent: these factors argue against significant sampling bias. Second, although overcrowding and fitness facility equipment and facility layout/design are clearly separate factors, in times of peak usage overcrowding could compromise equipment layout and facility design. However this potential conflation would be of relatively minimal import in the overwhelming majority of facilities where overcrowding was observed infrequently.

The findings from this study plainly suggest avenues for future research. For example, qualitative research with fitness professionals to determine their actual behaviours when a risk is encountered and could be minimised, such as when they observe a customer using incorrect technique.

CONCLUSION

The findings of this part of the AFIRM research suggest that a significant number of fitness professionals observe physical environment areas, equipment and customer training practices in their workplaces that require attention. Risk management strategies that address these issues should be developed, implemented and monitored. Approaches could include having a preventive maintenance of equipment and environment program incorporating regular inspections and record keeping. Providing supervision of the activity floor by qualified fitness professionals who have received extensive risk management training would also help support them in their role of overseeing customer safety and improving customer training practices.

PRACTICAL APPLICATIONS

Opportunities for implementation of risk management strategies lie with the routine operation of a fitness facility and the customers who exercise within it.

Preventive maintenance of both fitness equipment and the general physical environment can help minimise potential injury causing hazards at fitness facilities.

Qualified fitness professionals adequately trained in risk management can lead to improved customer training practices and safety.

REFERENCES

1. Australian Government Department of Health. Physical activity and sedentary behaviour (2014). Available at: <http://www.health.gov.au/internet/main/publishing.nsf/Content/pasb>. Date accessed October 30, 2014
2. World Health Organization. Physical activity (2015). Available at: <http://www.who.int/mediacentre/factsheets/fs385/en/>. Date accessed February 6, 2015
3. Australian Bureau of Statistics. Physical recreation (2011). Available at: <http://www.abs.gov.au/ausstats/abs@.nsf/Products/4156.0.55.001~Nov+>

- 2011~Main+Features~Physical+Recreation? OpenDocument. Date accessed November 20, 2014
4. Access Economics Pty Limited. Let's get physical: The economic contribution of fitness centres in australia (2009). Available at: <http://www.heartfoundation.org.au/SiteCollectionDocuments/Fitness-Centres.pdf>. Date accessed October 30, 2014
5. Bee, P. Is going to the gym bad for your health? (2006). Available at: <http://www.dailymail.co.uk/health/article-393921/Is-going-gym-bad-health.html>. Date accessed October 30, 2014
6. Sekendiz, B., Gass, G., Norton, K. and Finch, C.F. (2014). Cardiac emergency preparedness in health/fitness facilities in Australia. *The Physician and Sportsmedicine*, 42, 14-19. doi: 10.3810/psm.2014.11.2087
7. Gray, S.E. and Finch, C.F. (2015). Epidemiology of hospital-treated injuries sustained by fitness participants. *Research Quarterly for Exercise and Sport*, 86, 81-87
8. American College of Sports Medicine. (2012). *ACSM's Health/fitness facility standards and guidelines*. Champaign, IL: Human Kinetics.
9. Butler, J. Liability for workplace health and safety in the Australian fitness industry (2013). Available at: https://fitnessaustralia.s3.amazonaws.com/uploads/uploaded_file/file/247/Liability-for-Workplace-Health-and-Safety-in-the-Australian-Fitness-Industry.pdf. Date accessed 9 January, 2015
10. Finch, C., Donaldson, A., Otago, L. and Mahoney, M. (2009). What do users of multi-purpose recreation facilities think about safety at those facilities? *Sport Health*, 27, 31-35.
11. Dietrich, J. Liability arising from contract and under the Australian consumer law (2012). Available at: https://fitnessaustralia.s3.amazonaws.com/uploads/uploaded_file/file/245/Liability-Arising-From-Contract-and-Under-the-Australian-Consumer-Law-Report.pdf. Date accessed 9 January, 2015
12. Keyzer, P., Coyle, I.R., Dietrich, J., Norton, K., Sekendiz, B., Jones, V. and Finch, C.F. (2014). Legal risk management and injury in the fitness industry: The outcomes of focus group research and a national survey of fitness professionals. *Journal of Law and Medicine*, 21, 826-844.
13. Mazur, L.J., Yetman, R.J. and Risser, W.L. (1993). Weight-training injuries. Common injuries and preventative methods. *Sports Medicine*, 16, 57-63.
14. Kerr, Z.Y., Collins, C.L. and Comstock, R.D. (2010). Epidemiology of weight training-related injuries presenting to united states emergency departments, 1990 to 2007. *The American Journal of Sports Medicine*, 38, 765-771.
15. Coyle, I.R., Sleeman, S.D. and Adams, N. (1995). Safety climate. *Journal of Safety Research*, 26, 247-254.
16. Canadian Union of Public Employees. Ventilation (2011). Available at: <http://cupe.ca/updir/Ventilation.pdf>. Date accessed March 6, 2014
17. Chronic Obstructive Pulmonary Disease Foundation. How low oxygen levels affect the body (2009). Available at: http://www.copdbfrg.org/?page_id=984. Date accessed March 6, 2014
18. Victorian Workcover Authority. The dangers of poorly ventilated workplaces (2007). Available at: <http://www.vwa.vic.gov.au/forms-and-publications/forms-and-publications/the-dangers-of-poorly-ventilated-workplaces>. Date accessed November 20, 2014
19. Gerard, J. Consequences of lifting too heavily. Available at: <http://healthyliving.azcentral.com/consequences-lifting-heavily-2382.html>. Date accessed November 20, 2014
20. Gray, S.E. and Finch, C.F. (2015). The causes of injuries sustained at fitness facilities presenting to victorian emergency departments - identifying the main culprits. *Injury Epidemiology*, 2, doi: 10.1186/s40621-015-0037-4
21. Jones, C.S., Christensen, C. and Young, M. (2000). Weight training injury trends: A 20-year survey. *The Physician and Sportsmedicine*, 28, 61-72.
22. Commissioner for Fair Trading of the Australian Capital Territory. Fitness industry Code of Practice (2009). Available at: <http://www.legislation.act.gov.au/di/2009-65/current/pdf/2009-65.pdf>. Date accessed November 20, 2014
23. Fitness NSW. The NSW fitness industry Code of Practice (2006). Available at: <http://www.theforum.org.au/documents/NSW-Fitness-Industry-Code-of-Practice.pdf>. Date accessed November 20, 2014

24. Fitness Victoria. Fitness Victoria business member Code of Practice: Standards for the Victorian fitness industry (2007). Available at: http://korewellness.com.au/wp-content/uploads/2015/02/vic_fitness_industry_code_of_practice.pdf. Date accessed November 20, 2014